



FOOD SECURITY AND RAJASTHAN

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ABSTRACT

This research paper explores the nuanced understanding of “food security,” tracing its evolution from a mere “availability at all times of adequate world food supply” in the 1970s to Amartya Sen’s comprehensive perspective on entitlements in the 1980s. Sen’s emphasis on entitlements, beyond mere food availability, distinguishes his approach from traditional notions of effective demand. While Keynes’ effective demand related to monetary income in a capitalist economy, Sen’s analysis extends to a “mixed economy” with multiple classes.

In the context of Rajasthan, this study reveals the intricate dynamics of food security, considering diverse demographics, geographical variations, and vulnerability indicators. Urbanization trends, examined through three distinct phases, present potential implications for food distribution and accessibility across regions. Recognizing the heterogeneity of regions in Rajasthan, the paper stresses the importance of tailored policies that account for climatic variations, regional interests, and health demands.

A thorough investigation into the nutritional status of the population highlights concerning trends, particularly the prevalence of anemia and malnutrition among women and children. Despite advancements in education and awareness, persistent nutritional challenges demand a holistic approach addressing both immediate and underlying causes.

In conclusion, this research underscores the multi-faceted nature of food security challenges in Rajasthan. It advocates for targeted interventions incorporating sustainable agriculture, improved infrastructure, and inclusive policies. By addressing the root causes of food insecurity and malnutrition, the paper provides valuable insights for policymakers, researchers, and practitioners striving to enhance food security in the region.

INTRODUCTION

What is meant by the term “food security” has been the subject of a two-pronged understanding or defining process. In the 1970s, the concept of “food security” meant the “availability at all times of adequate world food supply of basic foodstuffs...” (UN, 1975). Amartya Sen’s book “Poverty and Famines: An Essay on Entitlement and Deprivation,” which was first published in 1981, contributed to the development of a fresh perspective on the issue of food insecurity and hunger. Instead of focusing just on the ‘accessibility’ of food, as opposed to its ‘availability,’ Sen put more of an emphasis on what he referred to as ‘entitlements,’ which are a mix of what an individual can produce and sell on the market, in addition to supplies supplied by the state or other social organisations. According to Sen’s theory, the mere fact that there is an availability or supply of food does not in and of itself establish a right to food. The emphasis that Sen places on entitlements is, in a way, analogous to the idea that Keynes had of “effective demand.”

The concepts of entitlement and effective demand are not the same thing at all as the concept of need. Because Keynes was addressing a completely capitalist market economy, which consisted of just two classes—employers and workers—at the time, every aspect of effective demand was connected to monetary income. However, Sen is dealing with what is known as a “mixed economy,” which consists of at least three

classes: employers, employees, and peasants or other own-account producers. Those who grow their own food are entitled to at least some of the benefits that come from their labour, if not all of them. The market does not act as a middleman for this percentage of the consumer’s food consumption. As a consequence of this, this is not accounted for by the concept of effective demand that is dependent on the market.

REVIEW OF LITERATURE

Though the term ‘Food Security’ has initially arrived in 1930s after World War One but it got acceptance and importance in the mid-1970s. At the World Food Conference 1974, food security defined as “*Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices*”. Further it explained in 1983 by FAO as “*Ensuring that all people at all times have both physical and economic access to the basic food that they need.*” World Bank in 1986 – “*The access by all people at all times to enough food for an active and healthy life.*”

With all such changes finally, a widely accepted definitions were framed at World Food Summit 1996, reinforcing the multidimensional nature of food and food security to the people by including food availability, accessibility, utility and stability.

Food security is an important parameter for economic stability, humanity and for feeding the future (Prof B.L. Lathi, Prag Nakhede). Cook and Frank, 2008 have explained the food security as access by all people at all times to enough food for an active, healthy life with at least minimum availability of nutritionally adequate and safe foods and assured ability to acquire acceptable foods in socially acceptable ways. Food security, is a complex issue which get affected by lots of factors like agricultural, storage capacity, international trading, poverty, income distribution, foreign aid, policies and government programmes, global population, climate change etc. (Prof B.L. Lathi, Prag Nakhede).

Similarly, Ashok Gulati has found that agriculture is a critical and necessary condition to reduce the malnutrition. Also, sanitation facilities and women's literacy in particular are the strong factors affecting malnutrition. Nord, Jensen and Gregory, 2014 have analysed that an increase in the 1 percentage point in the unemployment rate, annual inflation, annual relative price of food was associated with 0.5, 0.5 and 0.6 percentage point respectively in the prevalence of food security.

India has given importance to food security much earlier and initiates to ensure food security from concerted efforts to agricultural production to far-ranging market interventions aimed at both income and price stabilisation. Almost 69 per cent of Indians live in the rural areas and 58 per cent of these rural households are agricultural households (NSSO 2014). Small farms under cultivation, are the main providers of food and nutritional security to the nation, but have limited access to technology, inputs, credit, capital, and markets. (Ashok Gulati).

The Indian government has recognized malnutrition as a serious problem in every plan document (Ashok Gulati). Beside faster and more democratic political system, India is unable to provide two times food to all population. India has high level of hunger and poverty (Aviral Pandey). He analysed that food security problem is related to low demand. Without improving networks of food storage system in states, food security in India will not be achieved.

Is Rajasthan Food Secure?

In terms of landmass, Rajasthan is India's most extensive state, while its population density places it eighth among the country's states. It can be found at a latitude of 27.391277 and a longitude of 73.432617, which places it in the north-western region of the nation. The state of Rajasthan is broken up into thirty-three districts and seven divisions. There are four primary physiographic zones, which are as follows: (i) the western desert, which is characterized by its arid hills, rocky plains, and sandy plains; (ii) the Aravalli hills, which extend from south-west to north-east; (iii) the eastern lowlands, which are characterized by their rich alluvial soils; and (iv) the southeastern plateau. The Mahi, the Chambal, and the Banas rivers do the most of the draining for this state.

There are total 53 districts in the Rajasthan with total 10 divisions:

	Division	No. of Districts	Districts
1	Jaipur	7	Jaipur, Jaipur(rural), Dudu, Kotputli-bahrod, Dausa, Kherthal- Tijara, Alwar
2	Ajmer	7	Ajmer, Beawar, Kekdi, Tonk, Nagaur, Didwana- Kuchaman, Shahpura
3	Bharatpur	6	Bharatpur, Dholpur, Karoli, Deeg, Gangapur city, Sawai Madhopur
4	Jodhpur	6	Jodhpur, Jodhpur(rural), Phalodi, Jaisalmer, Badmer, Balotra
5	Udaipur	5	Udaipur, Chittorgarh, Bhilwara, Rajsamand, Salumbar
6	Sikar	4	Sikar, Jhunjhunu, Neem Ka Thana, Churu
7	Bikaner	4	Bikaner, Shreeganganagar, Hanumanagar, Anupgarh
8	Kota	4	Kota, Bundi, Baran, Jhalawar
9	Pali	4	Pali, Jalore, Sanchor, Sirohi
10	Banswara	3	Banswara, Dungarpur, Pratapgarh

The western half of the state has a climate that is hot and dry, whereas the eastern section of the state has a climate that is humid. In the summer, temperatures may vary from 32 degrees to 45 degrees Celsius, while in the winter, they can be anywhere from 4 degrees to 28 degrees Celsius. The monsoon months see close to 90 percent of the yearly rainfall, with the average annual rainfall falling anywhere between 200 and 400 millimetres and reaching as low as 150 millimetres in the driest regions. The state of Rajasthan has a climate that is characterized by a high frequency of droughts, which is another one of its distinctive features. According to Bansil (2007), droughts occur on average once every three years, although the frequency might sometimes be significantly greater. Rainfall that is little, insufficient, and erratic all contribute to the worsening of drought conditions. The severity of the hunger brought on by the failure of the monsoon and the subsequent lack of water creates tremendous misery for both people and their cattle. It happens once every three years in the districts of Barmer, Jaisalmer, Jalore, Jodhpur, and Sirohi. Drought strikes the regions of Ajmer, Bikaner, Bundi, Dungarpur, Sriganganagar, Nagaur, Hanumangarh, and Churu once every four years on average.

According to the Census of India: Administrative Atlas, 2001 and Bhalla (2011), the state is capable of being subdivided into four primary physiographic divisions. These divisions include the Western Sandy plains, the Aravalli and hilly areas, the Eastern plain, and the Hadoti plateau. There are three distinct zones that each include one of Rajasthan's 33 districts. It is possible to further subdivide the Western Sandy desert into the Sandy dry plains and the Sandy semi-arid plains. A portion of the Sandy plain is comprised of the microregions known as Marusthali and Dune free tracts. There are four distinct sub-regions that make up the semi-arid plain: the Luni basin, the Shekhawati region, the Nagauri Upland, and the Ghaggar plain. The Alwar hill area, the Central Aravalli range, the Mewar rocky range, and the Abu block region are all included in the Aravalli and hilly range. The Chambal basin, the Banas basin, and the Mahi plain make up what are known as the Eastern

plains. The Vindhyan trash land and the Deccan Lava plateau are both included in the Hadoti plateau's classification as micro-regions. Agriculture is still the most important industry in the state of Rajasthan, which has a population that is not uniformly dispersed across the state. Therefore, the expansion of alluvial plains and the availability of water will continue to serve as the primary variables in determining population distribution. The rate of urbanisation in Rajasthan has consistently been lower than the average for the country. The population of the state was counted at the 2011 census, and it was found that 76.62 percent of the population lives in rural regions. Agriculture and industry, notably handloom and handicrafts, play an important role in terms of the state's employment rate and revenue.

State Rajasthan comes in the category of low-income state. Moreover, with 39.1 percent of children under 5 years of children stunted and 23 per cent of wasted children under 5 years (Source – NFHS), Rajasthan continues to be one of the bottom five states of the country. A big part of its population depends upon food and nutrition entitlements under the National Food Security Act (NFSA).

According to NFHS, in year 2015-16, 46.8 percent of women, under the age of 15-49 years are anaemic and more than 60.3 percent children of age 6 – 59 months are anaemic. The breastfeeding rate among children between 6-23 months is 3.4% and the percentage of children between 6-8 months with minimum acceptable diets is 30.1%. On the other hand, obesity is also rising in Rajasthan, 14.1% adult women and 13.2% adult men are obese.

This situation of malnutrition and food insecurity in Rajasthan is majorly because of poverty, poor infrastructure, inequity etc. Hence it is very important to look after Rajasthan's food security. Considering the fact that Rajasthan is the largest state of the country in area, distance from one town to another, one city to another city is so long that it may affect various economic indicators. So somehow, this directly or indirectly affect the distribution of food among the towns and cities.

Rajasthan is now in its phase of rapid urbanization which may improve the distribution and distance factor for food security. That factor has to be studied in detail through this research.

Three major periods of urbanization in the state of Rajasthan are –

- Period of Slow Urbanization (1901 to 1941) – The population living in urban places declined 14.41% in 1901 to 12.87% in 1911.
- Period of Moderate Urbanization (1951 to 1971) - Urban population to total population jumped from 14.67% in 1941 to 17.1% in 1951
- Period of Rapid Urbanization (1981 to 2011) – Urbanization jumped from 17.4% in 1971 to 20.49% in 1981. In the successive census years of 1991, 2001 and 20011 level of urbanization in the state reached to 22.39%, 24.52 and 24.57% respectively.

A LOOK AT RAJASTHAN'S AGRICULTURE

Agriculture in Rajasthan is characterized by its diversity, unique challenges, and its significance in the state's economy and food security. Here's a detailed look at Rajasthan's agriculture:

1. Agro-climatic Diversity:

Rajasthan boasts diverse agro-climatic regions, ranging from arid and semi-arid to sub-humid and humid. These variations influence crop selection and agricultural practices across the state.

2. Major Crops:

- Cereals: Wheat, barley, and maize are the primary cereal crops grown in the state. Wheat is the dominant crop, particularly in the northwest.
- Pulses: Gram, lentils, and moth bean are the prominent pulse crops cultivated in Rajasthan.
- Oilseeds: Mustard and groundnut are the major oilseed crops.
- Cash Crops: Cotton and sugarcane are significant cash crops.

3. Traditional and Innovative Farming Practices:

Rajasthan's farmers have historically employed traditional water conservation methods, such as the construction of check dams, talabs (small ponds), and beris (step wells) to manage scarce water resources.

Drip and sprinkler irrigation systems are increasingly adopted to maximize water use efficiency.

4. Irrigation Systems:

Given the arid climate, irrigation plays a crucial role in crop production. Rajasthan has several canal systems, including the Indira Gandhi Canal, which has transformed arid regions into fertile agricultural areas.

5. Rain-fed Agriculture:

A substantial portion of Rajasthan's agriculture is rain-fed, relying on monsoon rains. Variability in monsoons poses a significant challenge for rain-fed agriculture.

6. Organic Farming:

Rajasthan is promoting organic farming practices, particularly in the cultivation of pulses, to reduce the reliance on chemical inputs and improve soil health.

7. Challenges:

- Water Scarcity: Rajasthan faces chronic water scarcity, and over-extraction of groundwater is a major concern. Sustainable water management is vital.
- Climate Change: Increasing temperatures and erratic rainfall patterns due to climate change impact crop yields and necessitate adaptation strategies.
- Land Degradation: Soil erosion, salinity, and land degradation are issues that need to be addressed to ensure long-term agricultural sustainability.

8. Livestock Farming:

Livestock, particularly cattle, buffalo, goats, and sheep, are

integral to Rajasthan's rural economy. They contribute to dairy, meat, and wool production.

9. Agricultural Diversity:

Rajasthan's diverse agro-climatic zones support the cultivation of a wide variety of crops, fruits, and vegetables, including citrus fruits, guava, and pomegranate.

10. Role in the Economy:

Agriculture is a significant contributor to Rajasthan's economy, providing livelihoods to a large portion of the state's population. Rajasthan's agriculture is a vital component of the state's economy and plays a crucial role in ensuring food security for its residents. To address the challenges presented by the arid climate and water scarcity, sustainable and innovative agricultural practices are essential for the state's continued agricultural development.

An examination of food insecurity in India, conducted by MSSRF/WFP through the Food Insecurity Atlas of Rural India, revealed that Rajasthan is among the nine states in India facing substantial food insecurity. Several factors contribute to the high levels of food insecurity and vulnerability in Rajasthan. These factors include frequent natural calamities like drought, a significant proportion of the population facing exclusion from full societal participation due to their caste and tribal identities, inadequate rural infrastructure, and distressing socio-economic circumstances affecting women and children.

Notably, Rajasthan exhibits some alarming statistics in comparison to other states in India. It ranks as the highest state for female illiteracy, with 63 percent of women lacking literacy skills, whereas men have a significantly lower illiteracy rate of 28 percent. Additionally, the state ranks third in terms of the gender ratio, with 921 females for every 1000 males, and it also holds the third position in infant mortality rates, with 80 infant deaths occurring per 1000 live births. These indicators underscore the pressing challenges facing Rajasthan in the domains of education, gender equity, and child health.

The distinguishing characteristics that delineate food-secure and food-insecure households, as discerned by the communities themselves, exhibit a degree of consistency across diverse regions in Rajasthan. Out of the ten pivotal indicators for gauging food insecurity, four stand out as paramount: the absence of access to land, substandard land quality, a dearth of able-bodied labor resources within the household, and persistent indebtedness.

While these vulnerability traits transcend regions, the degree of vulnerability fluctuates from one area to another. Banswara and Barmer, along with certain communities in Baran, bear a disproportionately high concentration of food-insecure households, whereas Churu and Ajmer, both in terms of numbers and the extent of vulnerability, present a relatively lower profile. Village-level statistics affirm that Scheduled Tribe areas such as Banswara and remote regions with limited resource bases, as typified by Barmer, register the highest prevalence of impoverished and food-insecure households.

Caste and tribe affiliation significantly influence vulnerability, with Scheduled Tribes (ST) and Scheduled Castes (SC) historically marginalized in terms of resource access and services. This pattern persists in Rajasthan, as corroborated by the survey, though certain aspects have shown signs of improvement.

The study identified several vulnerable household categories in the surveyed areas, including those residing in remote locations, landless or possessing minimal land holdings and limited assets, Scheduled Caste and Scheduled Tribe households, those headed by disadvantaged individuals, as well as women and children.

Geographically, the Southern Arid Plain, Southern Aravali Range, and Banas-Chambal Basin emerge as the focal points of food insecurity and vulnerability in Rajasthan.

Predominantly, rural households in Rajasthan depend partially on agriculture or agriculture-related pursuits for their livelihoods. Nonetheless, agriculture suffices for only about 50 percent of the requirements of the most vulnerable households. Diverse strategies are adopted by vulnerable groups across regions to complement their agricultural activities. In Banswara and Baran, forestry products play a more substantial role, complemented by public works tied to forest maintenance. In the arid expanse of Barmer, sheep and goats are herded for sale or wool production. Mining offers some employment in Ajmer and Churu. Across all regions, the most vulnerable households, constrained by limited land holdings, engage in post-primary agriculture season migration to augment their income.

Natural Hazards and Coping Patterns

Rajasthan faces chronic drought challenges, with over 60 percent of the state categorized as arid, and the remainder as semi-arid. Agro-pastoral systems better suit these arid and semi-arid regions, predominant in many districts. Nevertheless, the increased population and livestock growth over the last two decades have exerted pressure on surface and groundwater sources, rendering drought periods more acutely distressing. Both Rajasthan in general and the studied regions, in particular, have borne the brunt of three consecutive years of drought. This ordeal has affected not only marginalized community members but also the economically better-off.

The people of Rajasthan have weathered numerous crises over the years, with the droughts of 1998-2000 being exceptionally severe. Crop losses were staggering, ranging from 50 to 70 percent across all surveyed regions. Vulnerable groups resorted to extensive reliance on forest products, especially in Baran and Banswara. Mass migration, livestock sales, and borrowing became widespread coping mechanisms. Communities reported collecting mahua and bartering it for wheat. Village coping strategies underwent a profound transformation.

Consumption patterns exhibited stark disparities between regular and crisis years. Respondents cited six primary short-term food-based coping mechanisms: consuming less-preferred foods, reducing portion sizes, borrowing food or money for

food purchases, trimming non-food expenditures, curtailing women's food consumption, and reducing or skipping meals. Vulnerable households saw higher rates of migration, and they were compelled to sell livestock and valuable assets.

Nutritional Status of Rajasthan

Population and Household Profile	2020-21	2015-16
Female population age 6 years and above who ever attended school (%)	63.5	57.2
Population below age 15 years (%)	28.3	31.2
Sex ratio of the total population (females per 1,000 males)	1,009	973
Sex ratio at birth for children born in the last five years (females per 1,000 males)	891	887
Children under age 5 years whose birth was registered with the civil authority (%)	91.4	66.6
Deaths in the last 3 years registered with the civil authority (%)	77.1	na
Population living in households with electricity (%)	98.1	91.2
Population living in households with an improved drinking-water source ¹ (%)	96.5	93.7
Population living in households that use an improved sanitation facility ² (%)	71.1	46.1
Households using clean fuel for cooking ³ (%)	41.4	31.8
Households using iodized salt (%)	94.2	93.5
Households with any usual member covered under a health insurance/financing scheme (%)	87.8	18.7
Children age 5 years who attended pre-primary school during the school year 2019-20 (%)	8.9	na
Characteristics of Adults (age 15-49 years)		
Women who are literate (%)	64.7	na
Men who are literate (%)	88.9	na
Women with 10 or more years of schooling (%)	33.4	25.1
Men with 10 or more years of schooling (%)	51.9	43.8
Women who have ever used the internet (%)	36.9	na
Men who have ever used the internet (%)	65.2	na
Marriage and Fertility		
Women age 20-24 years married before age 18 years (%)	25.4	35.4
Men age 25-29 years married before age 21 years (%)	28.2	35.7
Total fertility rate (children per woman)	2	2.4
Women age 15-19 years who were already mothers or pregnant at the time of the survey (%)	3.7	6.3
Adolescent fertility rate for women age 15-19 years	31	46
Infant and Child Mortality Rates (per 1,000 live births)		
Neonatal mortality rate (NNMR)	20.2	29.8
Infant mortality rate (IMR)	30.3	41.3
Under-five mortality rate (U5MR)	37.6	50.7
Current Use of Family Planning Methods (currently married women age 15-49 years)		
Any method (%)	72.3	59.7
Any modern method (%)	62.1	53.5
Female sterilization (%)	42.4	40.7

Male sterilization (%)	0.3	0.2
IUD/PPIUD (%)	1.4	1.2
Pill (%)	3.1	2.4
Condom (%)	13.7	8.7
Injectables (%)	0.6	0.2
Unmet Need for Family Planning (currently married women age 15-49 years)		
Total unmet need (%)	7.6	12.3
Unmet need for spacing (%)	3.7	5.7
Quality of Family Planning Services		
Health worker ever talked to female non-users about family planning (%)	24.1	17.5
Current users ever told about side effects of current method ⁸ (%)	61	43.5
Nutritional Status of Adults (age 15-49 years)		
Women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m ²)(%)	19.6	27
Men whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m ²) (%)	14	22.7
Women who are overweight or obese (BMI ≥25.0 kg/m ²)(%)	12.9	14.1
Men who are overweight or obese (BMI ≥25.0 kg/m ²) (%)	15	13.2
Anaemia among Children and Adults		
Children age 6-59 months who are anaemic (<11.0 g/dl) (%)	71.5	60.3
Non-pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	54.7	46.8
Pregnant women age 15-49 years who are anaemic (<11.0 g/dl) (%)	46.3	46.6
All women age 15-49 years who are anaemic (%)	54.4	46.8
All women age 15-19 years who are anaemic (%)	59.4	49.1
Men age 15-49 years who are anaemic (<13.0 g/dl) (%)	23.2	17.2
Men age 15-19 years who are anaemic (<13.0 g/dl) (%)	34	22.1

In Rajasthan, basic services, education and awareness has been improved very well which can be seen through the above data given by NFHS. But nutritional level is still lacking behind. According to the NFHS data, It has been seen that number of women has increased in comparison to men in last five years (2015-16 to 2022-21) and the school participation of girls has been increased too. But on the other hand it has been realized that number of anaemic women as well as men has increased. As all women age 15-49 years who are anaemic has been raised to 54.4 percent in 2022 from 49.1 percent in 2015-16. The same has increased from 17.2 percent to 23.2 percent in men. Children age 6-59 months who are anaemic (<11.0 g/dl) (%) have been increased to 71.5 percent to 60.3 percent in the same interval.

CONCLUSION

In this study it has been realized that Rajasthan is very diverse and food security in Rajasthan delves into the complex dynamics. It is very difficult to ensuring a steady and adequate food supply for the state's diverse population.

The examination of urbanization trends in Rajasthan provides insight into potential shifts in food distribution and accessibility. The three distinct phases of urbanization, coupled with the state's vast geographical expanse, are considered as factors that may impact food security differently across regions.

One region is different from other and urbanization also varies a lot from area to area. The study delves into the crucial issue of food insecurity in Rajasthan, emphasizing vulnerability indicators, geographical variations, and coping mechanisms during natural hazards, particularly droughts.

So similar policies in the state of Rajasthan may not result in same level of food security. It is very crucial to understand the climatic situation, regional interests and people's health demand before any policy formation.

An in-depth look at the nutritional status of the population reveals concerning trends, with rising levels of anemia and malnutrition, especially among women and children. Despite improvements in education and awareness, nutritional challenges persist, necessitating a holistic approach to address both immediate and underlying causes.

In conclusion, the research paper underscores the multi-faceted nature of food security challenges in Rajasthan. It advocates for targeted interventions that consider the unique socio-economic, geographic, and demographic characteristics of the state. Emphasizing the need for sustainable agricultural practices, improved infrastructure, and inclusive policies, the paper calls for a concerted effort to address the root causes of food insecurity and malnutrition in Rajasthan. The findings of this research contribute valuable insights for policymakers, researchers, and practitioners working towards enhancing food security in the region.